S
639.9
F2prw
1977

[redacted]

QUARTERLY PROGRESS REPORT

POPLAR RIVER WATERFOWL/FURBEARER STUDY

September 30, 1977

[redacted]

STATE DOCUMENTS COLLECTION

JUN 1 3 2003

MONTANA STATE LIBRARY
1515 E. 6th AVE
HELENA, MONTANA 59620

Prepared by:

Rich DeSimone
Montana Department of Fish and Game

MONTANA STATE LIBRARY
3 0864 1002 0510 6

TABLE OF CONTENTS

Page
List of Tables ii
List of Figures iii

Introduction 1
Procedures 1
Study Area 2
Results 2
    Hatching Chronology 2
    Waterfowl Production 5

Literature Cited 8

Appendix 9

LIST OF TABLES

Table Page

1. Hatching dates of waterfowl broods observed on a segment of the East Poplar River during 1977 4

2. Number and average brood size of waterfowl broods observed on a segment of the East Poplar River during 1977. 6

3. Brood production and reproductive success of the duck population on a segment of the East Poplar River during 1977 . . 7

APPENDIX TABLES

4. Observations of furbearers and predators in Daniels County during summer, 1977. 10

5. Upland game brood information collected in Daniels County during summer, 1977. 11

6. Upland game observations by land form and vegetational cover in Daniels County during summer, 1977. 12

7. White-tailed deer observations in Daniels County during summer, 1977 13

8. Pronghorn antelope observations in Daniels County during summer, 1977 13

9. Observations of raptors in Daniels County during summer, 1977 14

10. Results of small mammal trapping in six locations along the East Poplar River, 1977. 15

LIST OF FIGURES

Figure Page

1. Map of Daniels County 3

INTRODUCTION

Field work continued in Daniels County during the summer to determine wildlife utilization along the Poplar River. This work is related to the effects of reduced water flows in the east fork of the Poplar River due to water needs of a power generating plant two miles north of the U. S.-Canadian border. A progress report was completed covering the period from April 1 to June 30 (DeSimone, 1977), and this report presents information collected from July 1 to September 30. The objectives of this project are:

(1) Identify wildlife species dependent upon the Poplar River.
(2) Determine the life history requirements of the key wildlife populations now found in and along the Poplar River.
(3) Describe habitat characteristics critical to meeting the ecological requirements of key wildlife species.
(4) Relate this ecological information to changes effected by the power plant complex development and predictable alterations that would occur with expanded water consumption.

This report is designed to present data collected during the summer report period. Extensive data interpretation and overall conclusions will not be made until the final report.

PROCEDURES

Field work during this summer period was primarily concerned with determining waterfowl brood production on the East Poplar River. Fifty-two miles of the East Poplar River was inventoried three times on foot and waterfowl broods were recorded by date as to species, size and age-class. Calculation of brood production followed the procedure described by Gollop and Marshall, 1954. Broods observed on more than one occasion were termed resident, while broods observed only once were termed transient (Berg, 1956).

Observations of wildlife other than waterfowl were also collected during the summer during vehicular surveys and while afoot and plotted on U. S. Geological maps (1:24,000). Furbearer and predator observations made along the Poplar River and in Daniels County are presented in Appendix Table 4. Brood information was collected for the ring-necked pheasant *(Phasianus colchicus)*, sharp-tailed grouse *(Pedioecetes phasianellus)*, Hungarian partridge *(Perdix perdix)*, and sage grouse *(Centrocercus urophasianus)* and is given in Appendix Table 5. Game birds, white-tailed deer *(Odocoileus virginianus)*, Pronghorn antelope *(Antilocapra americana)*, and raptor observations are presented in Appendix Tables 6, 7, 8 and 9, respectively. Small mammal trapping using snap-traps was conducted along the East Poplar River (Appendix Table 10). Six habitats were sampled following the procedures outlined by Calhoune, 1948.

STUDY AREA

Fifty-two miles of the East Poplar River was inventoried for waterfowl brood production (Figure 1). The segment of the river studied started at the U. S.-Canadian border, 14 miles north of Scobey and continued to the Fort Peck Indian Reservation boundary in Daniels County. Although the East Poplar becomes the main Poplar two miles west of Scobey (where the East and Middle forks join), in this report it will be considered the East Poplar.

The East Poplar was divided into four portions. Portion one starts at the Canadian border and continues south to the bridge on Highway 13 approximately six miles south of Canada. The second portion starts at the end of the first and continues to the bridge two miles west of Scobey (on Highway 248). The third portion starts at the end of the second and continues to the bridge on Highway 13 five miles south of Scobey, and the fourth portion starts at the end of the third and continues to the Indian Reservation boundary.

Wildlife observations were recorded as to land form and vegetational cover. The two land forms recognized in Daniels County were benchland (designated as number 2 in all tables) and stream bottom (designated as number 4). Each vegetational type was assigned a letter:

a. Grain crops, stubble, summer-fallow (usually wheat)
b. Hay crops
c. Grazed grassland
d. Ungrazed grassland
f. Brush patches (mostly snowberry and rose)
i. Road edge
j. Homestead
k. Windbreaks and shelterbelts

RESULTS

Hatching Chronology

Hatching dates of waterfowl broods observed on the East Poplar River are given in Table 1. Broods were back dated from the day of first observation using the mid-point of the assigned age-class to determine approximate hatching dates (Gollop and Marshall, 1954). Hatching extended over a 129-day period. The first brood, a mallard *(Anas platyrhynchos)*, was observed on May 27 and was calculated to have been hatched on May 4. Taking into account approximately 28 days of incubation (Girard, 1941), this would indicate that egg laying was initiated during the first week in April.

The hatching chronology of waterfowl in a particular area is not consistent from year to year and the peak of hatching may be displaced by one or more weeks due to the severity of spring weather. The spring of 1977 was unseasonably warm and dry, which resulted in egg laying starting soon after the arrival of breeding pairs. Hatching chronology during this

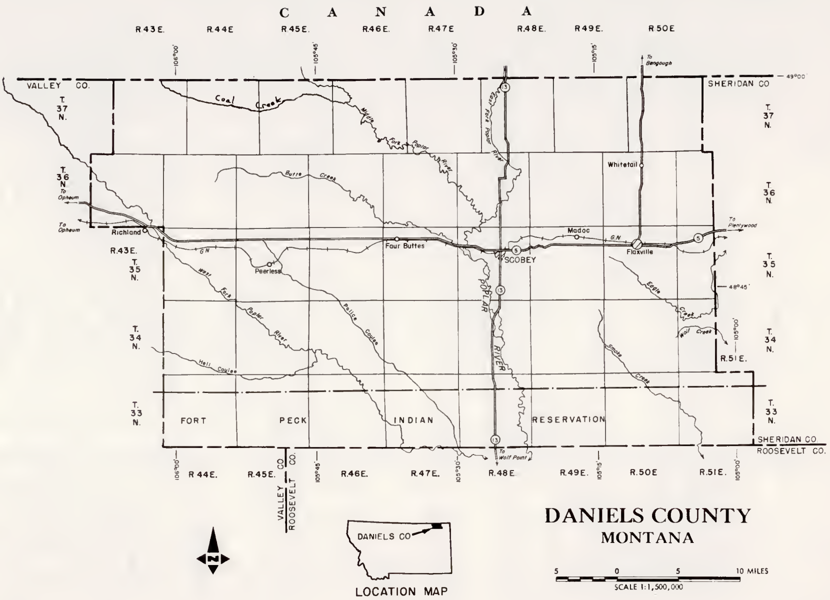

Figure 1. Map of Daniels County

Table 1. Hatching dates of waterfowl broods observed on a segment of the East Poplar River during 1977.

	MAY 1-10	MAY 11-20	MAY 21-31	JUNE 1-10	JUNE 11-20	JUNE 21-30	JULY 1-10	JULY 11-20	JULY 21-31	AUGUST 1-10
Mallards	1[1]/1.8[2]/1.8[3]	6/10.7/2.5	4/7.1/19.6	7/12.5/32.1	10/17.9/50.0	4/7.1/57.1	17/30.4/85.5	3/5.4/92.9	3/5.4/98.2	1/1.8/100
American wigeon					4/17.4/17.4	5/21.7/39.1	9/39.1/78.3	5/21.7/100		
Pintails			1/12.5/12.5	2/25.0/37.5	3/37.5/75.0	1/12.5/87.5		1/12.5/100		
Blue-winged teal						2/20.0/20.0	6/60.0/80.0		1/10.0/90.0	1/10.0/100
Gadwall						1/6.3/6.3	10/62.5/68.8	5/31.3/100		
Northern shoveler					1/50.0/50.0		1/50.0/100			
Total	1/0.9/0.9	6/5.2/6.1	5/4.3/10.4	9/7.8/18.3	18/15.7/33.9	13/11.3/45.2	43/37.4/82.6	14/12.2/94.8	4/3.5/98.3	2/1.7/100

---

[1] Number of broods hatched during time interval.

[2] Percentage of total hatch during time period.

[3] Cumulative percentage of hatch by the end of each time period.

spring generally followed the sequence reported by Mundinger (1975) for Phillips County, Montana during 1973 and Ellig (1955) for Greenfields Lake, Montana during 1952. Mundinger in 1974 and Ellig in 1951 reported a delay in the hatch due to lower temperatures and greater precipitation during early spring. Inclement weather during the spring, which affects ovulation and resultant hatching peaks, has also been discussed by Dzubin and Gollop (1972), Yocum and Hansen (1960) and Sowls (1955).

For all species combined, the peak of hatching occurred during the first 10 days of July when 37.4 percent of all broods hatched. Mallards and pintails *(Anas acuta)* were early nesting species followed by American wigeon *(Anas americana)*, northern shovelers *(Anas clypeata)* and finally blue-winged teal *(Anas discors)* and gadwalls *(Anas strepera)*.

Waterfowl Production

Waterfowl broods observed on the East Poplar River and average brood size by species are presented in Table 2. Average brood size within age-classes for each species were generally lower than those given by Bellrose (1976) for combined North American studies. There was an increase in brood size from Class II to Class III for the American wigeon broods and an increase from Class I to Class II in the pintails. This increase was attributed to combining of young from different broods (Bellrose 1976, Dzubin and Gollop (1972) and Ellig (1955).

Brood production and reproduction success is given in Table 3. Reproductive success was estimated by comparing the number of broods observed (including transients) with the number of breeding pairs. Reproductive success was generally lower than reported in other studies (Mundinger 1975, Smith 1971, Keith 1961) except for the gadwall and American wigeon which were about the same or higher. The number of ducklings reared to flight was estimated by multiplying the average Class II brood size by the number of broods (Gollop and Marshall, 1954). Class II broods were used because there is apparently little mortality between these and Class III broods and probably less combining of broods at this stage.

Several assumptions are made in production estimates using brood counts which could not be tested during this study. Some of these include: that all broods produced on the area were observed; that broods were assigned to their correct age-class and identified correctly to species; that egress of broods from the area equals ingress and all hens counted during the spring breeding-pair census attempted to lay one or more clutches. These problems will be discussed in subsequent reports.

Table 2. Number and average brood size of waterfowl broods observed on a segment of the East Poplar River during 1977.

	Class I			Class II			Class III			
	No. Broods	No. Young	Avg. Brood Size	No. Broods	No. Young	Avg. Brood Size	No. Broods	No. Young	Avg. Brood Size	Percent Mortality[1]
Mallards	28	143	5.1	37	148	4.0	46	156	3.4	33.3
American wigeon	10	59	5.9	17	72	4.2	12	64	5.3	10.2
Pintails	7	28	4.0	4	17	4.3	3	8	2.7	32.5
Blue-winged teal	5	29	5.8	2	7	3.5	7	30	4.3	25.9
Gadwall	11	70	6.4	6	30	5.0	10	48	4.8	25.0
Northern shoveler	--	--	--	2	9	4.5	1	3	3.0	--
Total	61	322	5.3	68	283	4.2	79	309	3.9	26.4

[1] Mortality from Class I to Class III.

Table 3. Brood production and reproductive success of the duck population on a segment of the East Poplar River during 1977.

Species	Number of Broods			Percent of Total Broods	Number of Breeding Pairs	Percent of Total Breeding Pairs	Reproductive Success[3]	Number Ducklings[4]
	Res[1]	Trans[2]	Total					
Mallards	45	11	56	48.7	162	62.8	34.6	190
American wigeon	15	8	23	20.0	37	14.3	62.2	122
Pintail	6	2	8	7.0	21	8.1	38.1	22
Blue-winged teal	6	4	10	8.7	13	5.1	76.9	43
Gadwall	10	6	16	13.9	18	7.0	88.9	76
Northern shoveler	1	1	2	1.7	7	2.7	28.6	6
Total	83	32	115	100	258	100	44.8	459

[1] Resident brood--a brood observed on more than one occasion.

[2] Transient brood--a brood observed only once.

[3] Reproductive success--derived from the total broods observed expressed as a percentage of the breeding pairs.

[4] Number ducklings--derived by multiplying the total number of broods by the average Class II brood size (Table 2).

LITERATURE CITED

Bellrose, F. C. 1976. Ducks, geese and swans of North America. Wild. Mgt. Inst. 544 p.

Berg, P. F. 1956. A study of waterfowl broods in eastern Montana with special reference to movements and the relationship of reservoir fencing to production. J. Wildl. Mgt. 20(3):253-262.

Calhoune, J. B. 1948. North American Census of Small Mammals. Release No. 1. Rodent Ecology Project, John Hopkins Univ., Baltimore, Md.

DeSimone, R. D. 1977. Quarterly Progress Report. Poplar River Waterfowl/Furbearer Study. Montana Dept. of Fish and Game. 30 p.

Dzubin, A. and J. B. Gollop. 1972 (1969). Aspects of mallard breeding ecology in Canadian parkland and grasslands. P. 113-152 in Population ecology of migratory birds. Bur. Sport Fish & Wildl., Wildl. Res. Rep. 2. 278 p.

Ellig, L. J. 1955. Waterfowl relationships to Greenfields Lake, Teton County, Montana. Mont. Fish & Game Comm. Tech. Bull. No. 1. 35 p.

Girard, G. L. 1941. The mallard: its management in western Montana. J. Wildl. Mgt. 5:223-259.

Gollop, J. B. and W. H. Marshall. 1954. A guide for aging duck broods in the field. Miss. Flyway Counc. Tech. Sect. 14 p.

Keith, L. D. 1961. A study of waterfowl ecology on small impoundments in southeastern Alberta. Wildl. Mono. No. 6. 88 p.

Mundinger, J. M. 1975. The influence of rest-rotation grazing management in waterfowl production in stock-water reservoirs in Phillips County, Montana. M.S. Thesis. Montana State Univ., Bozeman. 100 p.

Smith, A. G. 1971. Ecological factors affecting waterfowl production in Alberta parklands. Resource Pub. 98 of the Bureau of Sport Fish & Wildl., Washington, D.C. 49 p.

Sowls, L. K. 1955. Prairie ducks: a study of their behavior, ecology, and management. The Stackpole Co., Harrisburg, Pa., and Wildl. Mgt. Institute, Washington, D.C. 193 p.

Yocum, C. F. and H. A. Hansen. 1960. Population studies of waterfowl in eastern Washington, J. Wildl. Mgt. 24:237-250.

APPENDIX

Table 4. Observations of furbearers and predators in Daniels County during summer, 1977.

Common Name	Scientific Name	East Fork Poplar River[1/] Portion				Middle Fork Poplar River	Coal Creek	Butte Creek	Total
		1	2	3	4				
Beaver (observations)	*Castor canadensis*	1	5	4	2				12
(sign)		1	9	4	0	1			15
Muskrat	*Ondatra zibethica*	0	5	6	1			1	14
Mink	*Mustelx vison*	2	3	2	0				7
Raccoon	*Procyon lotor*		1	2					3
Coyote	*Ganis latrans*	1							1
Fox	*Vulpes fulua*	1	1						2
Porcupine	*Erethizon dorsatum*		1					1	2
Stripped skunk	*Mephitis mephitis*				1		1	1	3
Long-tailed weasel	*Mustela frenata*					1			1
Badger	*Taxidea taxus*					1			1

1/ See study area for description of the river portions.

Table 5. Upland game brood information collected in Daniels County during summer, 1977.

	Ring-necked Pheasant	Sharp-tailed Grouse	Hungarian Partridge	Sage Grouse
Number Broods				
July	13	12	22	--
August	4	4	7	4
Total	17	16	29	4
Number Young				
July	59	59	192	--
August	14	15	50	20
Total	73	74	242	20
Average Young/brood				
July	4.5	4.9	8.7	---
August	3.5	3.8	7.1	5.0
Total	4.3	4.6	8.4	5.0

Table 6. Upland game observations by land form and vegetational cover in Daniels County during summer, 1977.

Land Form 1/	Vegetational Cover 1/	Ring-necked Pheasant						Sharp-tailed Grouse					Hungarian Partridge					Sage Grouse			
		Males	Females	Young	Unclass.	Total	Percent 2/	Adult	Young	Unclass.	Total	Percent 3/	Adult	Young	Unclass.	Total	Percent 4/	Males	Females	Young	Total
4	ai	1				1	0.5				0	0	2	7		9	2.3				0
4	ak					0	0				0	0	2	9		11	2.9				0
4	b	1	1	7		9	5.2				0	0				0	0				0
4	c	2		1	3	6	3.5	1	4	6	11	10.7	7	25	24	56	14.8				0
4	ci					0	0				0	0		3		3	0.8				
4	d	2				2	1.2				0	0				0	0				0
4	f	9	12	44	20	85	48.9	2	7	4	13	12.6			14	14	3.7	1	2	20	23
4	fi	5	2	10	5	22	12.6	1			1	1.0				0	0				0
4	j	1				1	0.5				0	0				0	0				0
Subtotal		21	15	62	28	126	72.4	4	11	10	25	24.3	11	44	38	93	24.5	1	2	20	23
2	a	1			8	9	5.2	1	4		5	4.9	7	32	21	60	15.8				0
2	ai	5	1	12		18	10.3	3	23		26	25.2	22	106	8	136	35.9				0
2	aj					0	0				0	0		4		4	1.1				0
2	ak	1				1	0.5				0	0				0	0				0
2	bi					0	0				0	0	1	9		10	2.6				0
2	c	1	1			2	1.2	2	12		14	13.6	2	13	23	38	10.0				0
2	ci	1			11	12	6.9	6	21		27	26.2	2	20		22	5.8				0
2	di					0	0	2	4		6	5.8				0	0				0
2	fi			5	1	6	3.5				0	0	2	14		16	4.2				0
Subtotal		9	2	17	20	48	27.6	14	64	0	78	75.7	36	198	52	286	75.5	0	0	0	0
TOTAL		30	17	79	48	174	100	18	75	10	103	0	47	242	90	379	0	1	2	20	23

1/ See study area for description of land forms and vegetational cover types.
2/ Percent of all pheasant observations.
3/ Percent of all sharptail observations.
4/ Percent of all hun observations.

Table 7. White-tailed deer observations in Daniels County during summer, 1977.

Date	Type	Land Form [1/]	Vegeta-tional Cover [1/]	Location T	Location R	Location S	Bucks	Does	Fawns	Un-class.
7/19	Ground	2	a	35N	48E	34			1	
7/22	Ground	4	f	37N	45E	17		1	3	
8/18	Ground	2	b	35N	47E	31		1	2	
8/18	Ground	2	a	34N	47E	6		1	2	
8/23	Ground	4	a	36N	48E	2		1		
8/23	Ground	4	c	36N	48E	27				1
8/24	Ground	4	c	35N	48E	7				1
8/25	Ground	4	f	35N	48E	21		1	1	
8/25	Ground	4	f	35N	48E	28		1		
9/12	Aerial	4	f	37N	45E	1		1		
9/12	Aerial	4	f	37N	45E	10		2		
9/12	Aerial	4	f	37N	45E	18	1			
Total							1	9	9	2

1/ See Study Area for description of land forms and vegetational cover types.

Table 8. Pronghorn antelope observations in Daniels County during summer, 1977.

Date	Type	Land Form [1/]	Vegeta-tional Cover [1/]	Location T	Location R	Location S	Bucks	Un-class.
8/18	Ground	2	a	34N	46E	2	2	
9/12	Aerial	2	c	35N	44E	22		5

1/ See Study Area for description of land forms and vegetational cover types.

Table 9. Observations of raptors in Daniels County during summer, 1977.

	Benchland 1/					Sub-	Stream Bottom 1/					Sub-	
Species	a	b	c	d	f	total	a	b	c	d	f	total	Total
July													
Marsh Hawk	38		12		2	52	2					2	54
Swainson's hawk	6		7	2		15	2		2			4	19
Golden eagle						0			2			2	2
Burrowing owl			10			10			1			1	11
American kestel	7					7						0	7
August													
Marsh hawk	7		1			8	1		6		2	9	17
Swainson's hawk	1	1	2			4			3			3	7
Burrowing owl			5			5						0	5
Ferruginous hawk			1			1						0	1
Great-horned owl	1					1						0	1
Short-earred owl						0			1			1	1
Prairie falcon						0			1			1	1
September													
Marsh hawk	5		5			10			1		1	2	12
Swainson's hawk	5		3			8						0	8
Short-earred owl					1	1						0	1
Prairie falcon					1	1						0	1
Golden eagle			3			3						0	3
Rough-legged hawk	1					1						0	1
American kestel			3			3						0	3

1/ See study area for description of vegetational cover types.

Table 10. Results of small mammal trapping in six locations along the East Poplar River, 1977.

	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Total
Location	¼SW, Sec.3, T34N, R48E	¼SW, Sec.8, T37N, R48E	¼NE, Sec.20, T34N, R48E	¼NE, Sec.5, T37N, R48E	¼SE, Sec.14, T36N, R48E	¼SE, Sec.17, T35N, R48E	
Surrounding Land Use	Wheat	Grassland	Silver sage/ grassland	Grassland	Wheat	Grassland	
Treatment	Ungrazed	Grazed	Grazed	Grazed	Ungrazed	Grazed	
Shoreline Type	Grass/Weeds	Grass	Silver sage/ Grass	Grass/ Emgent Veg./ Floating Veg.	Shrubs	Shrubs	
Number Traps	60	60	60	60	60	60	360
Number Trap Nights	180	180	180	180	180	180	1,080
Peromyscus spp.	4 Females 1 Male	0	3 Females 5 Males	1 Female 1 Male	9 Females 9 Males	6 Females 6 Males	45
Murotus pennsylvanius	2 Males	0	0	2 Males	3	3	10
Sorex spp.	2	0	0	2	5	13	22
Total	9	0	8	6	26	28	77
Trap Success1/	5.0	0	4.44	3.33	14.4	15.55	7.13

1/ Number individuals per 100 trap nights.